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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/851,725
Filing Date: May 08, 2001
Appellant(s): YEH ET AL.

Crystal D. Sayles, Reg.No. 44318
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 10/23/2006 appealing from the Office action mailed 05/12/2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

US Patent 6269401	Fletcher et al.	July 31, 2001
US Patent 5636371	Yu	June 3, 1997
US Publication 2001/0056456	COTA-ROBLES	December 27, 2001

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> **(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.**

Claims 1-6, 9-14,17-20,29-30 are rejected under 35 U.S.C. 103(e) as being unpatentable over Fletcher et al. (US Patent 6269401) hereinafter referred to as Fletcher, in view of Yu (US Patent 5636371).

With respect to Claims 1-6, 9-14,17-20, Fletcher substantially discloses the features and limitations as described by the Applicant.

With respect to Claims 1, 3, 9, 11, and 17 Fletcher discloses testing a computer system to be operated in a multi-computer environment, comprising: executing server code at a computer system under test; executing client code at said computer system under test; and calculating performance data for said computer system under test (See Fletcher Column 3 Lines 30-60) . Furthermore, Fletcher discloses testing a computer system to be operated in a multi-computer environment, comprising: executing server code at a computer system under test according to a multi-computer communication protocol (Column 8 Lines 60-65) ; executing client code on said computer system under test according to said multi-computer communication protocol; and calculating performance data for said computer system under test operating as one of a server and a client. (See Fletcher Column 3 Lines 30-60, Figure 1 Column 5 Lines 15-50, Figure 2 Column 5 Lines 55-67).

However, Fletcher does not disclose (re. Claims 1, 3, 9, 11, 17) a single computer system emulating a server and a client, said computer executing server code and also executing client code.

Yu discloses (re. Claims 1, 3, 9, 11, 17) of a virtual network mechanism that allows a single host system to emulate multiple server and client processes, allowing data to be passed between said processes, and executing server and client code in the same said host system. (Yu- Column 4 Lines 1-25, Column 5 Lines 1-25, Column 8 Lines 1-25)

Fletcher and Yu are analogous art because they teach concepts and practices regarding capture of data between server and client processes and execution of said server and client processes. At the time of the invention it would have been obvious to a person of ordinary skill in the art to combine the teachings of Yu into Fletcher , such that the Fletcher is able to 1) emulate server and client processes in the same single host computer system and 2) execute both server code and client code in the said host computer. The suggested motivation for doing so would have been, as Yu suggests (Yu - Abstract), to eliminate the need to 1) specify additional protocol stacks and 2) provide additional communication hardware facilities for the handling multiple instances of application programs.

With respect to Claims 2 and 10, Fletcher discloses the method and set of instructions of Claims 1 and 9 for tracking an execution time for each of said threads by

a processor in said computer system under test; and tracking a number of transactions completed between the execution of server code and the execution of client code wherein said performance data is based on said number of transactions completed over a period of time. (See Fletcher Column 20, Lines 30-60, Column 23 Lines 45-65, Column 24 Lines 1-67).

With respect to Claims 4,12 and 18, Fletcher discloses the method, set of instructions and system of Claims 3,11, and 17 wherein said server code and client code includes a number of threads, the method further comprising: tracking an execution time for each of said threads by a processor in said computer system under test. (See Fletcher Column 20, Lines 30-60, Column 23 Lines 45-65, Column 24 Lines 1-67).

With respect to Claims 5,13, and 19, Fletcher discloses the method, set of instructions and system of Claims 4, 12, and 18 wherein said multi-computer communication protocol defines transactions between said server and said client, the method further comprising: tracking a number of transactions completed between the execution of server code and the execution of client code. (See Fletcher Column 20, Lines 30-60, Column 23 Lines 45-65, Column 24 Lines 1-67).

With respect to Claims 6,14 and 20, Fletcher discloses the method, set of instructions and system of Claims 5, 13, and 19 wherein said performance data is based on said number of transactions completed over a period of time. (See Fletcher Column 24, Lines 5-18, Lines 30-50)

With respect to Claims 29,30 the combination of Fletcher-Yu disclosed wherein the performance data for said single computer system is representative of said computer system acting as a server or said single system acting as a client. (Yu- Column 4 Lines 1-25, Column 5 Lines 1-25, Column 8 Lines 1-25)

Claims 7,15, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fletcher et al. (US Patent 6269401) hereinafter referred to as Fletcher, in view of Yu (US Patent 5636371), as applied to Claims 1-6, 9-14,17-20 above, further in view of Cota-Robles (US PG Publication 2001/0056456).

With respect to Claims 7,15, and 21, the combined teachings of Fletcher and Yu substantially disclose the method, set of instructions and system of Claims 6, 14, and 20 wherein said performance data is based on said number of transaction completed over said period of time. (See Fletcher Column 24, Lines 5-18, Lines 30-50, Column 25 Lines 1-45)

However the combination of Fletcher and Yu does not disclose (re. Claims 7,15, 21) any teachings regarding a scaling factor and said performance data being modified by a scaling factor.

Cota-Robles discloses (re. Claims 7,15, 21) a scaling factor that is calculated and applied as a characteristic or 'execution state indicator' or 'dynamic priority

indicator' of a thread process. The scaling factor can be calculated as a positive scaling factor or a negative scaling factor, depending on the performance data measurements taken for a particular thread. (Page 2 Paragraph 13,Page 3 Paragraph 33, Page 5 Paragraphs 54-56).

Fletcher, Yu and Cota-Robles are analogous art because they are presenting solutions for measuring thread execution data and using the performance data for calculations that describe characteristics of thread execution dynamics in a computer system environment. At the time of the invention it would have been obvious to a person of ordinary skill in the art to apply the concept of a scaling factor taught by Cota-Robles and use the scaling factor to modify the performance data measured by the combination of Fletcher and Yu . The suggested motivation for doing so would have been, as suggested by Cota-Robles (Page 2 Paragraph 23), to overcome the limitations of single context processors which execute instructions from one thread at a time, wherein priority-based scheduling algorithms unambiguously determine when and under what circumstances different threads access the processor. Furthermore it would have been obvious combine in order to present a logical means for comparing performance testing results with relative atomicity, consistency, and isolation. Furthermore the scaling factor allows the test conditions to be adjusted accordingly in order to simulate or predict performance under other testing scenarios.

Claims 8,16, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fletcher et al. (US Patent 6269401) hereinafter referred to as Fletcher, in view of Yu (US Patent 5636371), as applied to Claims 1-6, 9-14,17-20 above, further in view of Cota-Robles (US PG Publication 2001/0056456).

With respect to Claims 8,16, and 22, the combined teachings of Fletcher and Yu substantially disclose the method, set of instructions and system of Claims 7, 15, and 21 as described the rejection for Claims 7, 15, and 21. Fletcher discloses measuring the total execution time for both client and server threads (Column 7 Lines 5-67, Column 8 Lines 25-30) and measuring one of an execution time for said server threads and an execution time for said client threads (Column 20 Line 30-60).

However the combination of Fletcher and Yu does not disclose (re. Claims 8,16, and 22) any teachings regarding a scaling factor, where said scaling factor is a total execution time for both client and server threads divided by one of an execution time for said server threads and an execution time for said client threads.

Cota-Robles discloses (re. Claims 8,16, and 22) a scaling factor that is calculated and applied as a characteristic or 'execution state indicator' or 'dynamic priority indicator' of a thread process. The scaling factor can be calculated as a positive scaling factor or a negative scaling factor, depending on the performance data measurements taken for a particular thread. (Page 2 Paragraph 13,Page 3 Paragraph 33, Page 5 Paragraphs 54-56). Cota-Robles teaches of a scaling function having linear

dependencies wherein said scaling function is expressed as a ratio between a sum of the total occurrence for a unit of measurement data and a singular occurrence of a unit of measurement data. (Page 5 Paragraphs 49-50)

Fletcher, Yu and Cota-Robles are analogous art because they are presenting solutions for measuring thread execution data and using the performance data for calculations that describe characteristics of thread execution dynamics in a computer system environment. At the time of the invention it would have been obvious to a person of ordinary skill in the art to apply the concept of a scaling factor as taught by Cota-Robles, determine a suitable scaling function, calculate the scaling factor and use the scaling factor to modify the performance data measured by the combination of Fletcher and Yu . The scaling function can be expressed as a ratio between the total execution time for both client and server threads divided by one of an execution time for said server threads and an execution time for said client threads.

The suggested motivation for doing so would have been, as suggested by Cota-Robles (Page 2 Paragraph 23) , to overcome the limitations of single context processors which execute instructions from one thread at a time, wherein priority-based scheduling algorithms unambiguously determine when and under what circumstances different threads access the processor. Furthermore the combination would have been obvious in order to present a logical means for comparing performance testing results with relative atomicity, consistency, and isolation. Furthermore the scaling factor allows the test conditions to be adjusted accordingly in order to simulate or predict performance under other testing scenarios.

Claims 23-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fletcher et al. (US Patent 6269401) hereinafter referred to as Fletcher, in view of Yu (US Patent 5636371), as applied to Claims 1-6, 9-14,17-20 above, further in view of Cota-Robles (US PG Publication 2001/0056456).

With respect to Claim 23, 25, 27 the combination of Fletcher and Yu wherein said server code comprises a number of server threads, and said client code comprises a number of client threads. (Fletcher - Column 23 Lines 30-40) With respect to Claim 28, the combination of Fletcher an Yu disclose wherein data from server threads and clients threads are transmitted to sockets. (Fletcher- Column 7 Lines 15-20, Lines 30-35)

However the combination of Fletcher and Yu does not disclose (re. Claims 23, 25,27,28) of executing scheduler code, said scheduler code comprising a number of scheduler threads, said scheduler threads for coordinating communications of data between said client threads and said server threads.

With respect to Claims 24,26 the combination of Fletcher and Yu does not disclose wherein executing said scheduler code includes interfacing with a queue to store data packets to be transferred to a client thread or a server thread.

Cota-Robles discloses (re. Claims 23, 25) of a simultaneous multi-threaded architecture that combines operating system (OS) priority information with thread execution heuristics to provide dynamic priorities for selecting thread instructions for processing. The OS can schedule multiple threads belonging to different applications such as server or client applications onto an SMT processor concurrently. (Page 2 Paragraph 23-27). Cota-Robles discloses (re. Claims 24, 26) the SMT processor using instruction queues for storing data according to which execution unit is necessary to implement the thread. (Page 3 Paragraph 35-37)

Fletcher, Yu and Cota-Robles are analogous art because they are presenting solutions for measuring thread execution data and using the performance data for calculations that describe characteristics of thread execution dynamics in a computer system environment. At the time of the invention it would have been obvious to a person of ordinary skill in the art to implement a thread scheduler as taught by Cota-Robles into the combination of Fletcher and Yu , such that the scheduler is able to 1) recognize and reassign the priorities of the server threads and the client threads for maximum efficiency and throughput and 2) transfer the necessary data to the server or client thread in order to complete execution of the thread. The suggested motivation for

doing so would have been, as Cota-Robles suggests (Page 2 Paragraph 23), to overcome the limitation of single context processors which execute instructions from one thread at a time.

(10) Response to Argument

With regards to independent claims 1, 3, 9, 11, and 17

The Applicant presents the following argument(s) [*in italics*]:

'...The teachings of Yu do not appear to be concerned with the measurement of performance and do not mention use of a single computer system to virtualize or emulate an entire network of servers, clients, protocol, data, communication channels, etc....

The Examiner notes that Yu is not relied upon for disclosing *'measurement of performance'*. Rather Yu is relied upon to disclose *'a single computer system emulating a server and a client, said computer executing server code and also executing client code.'* In Yu, the server 92 communicates with emulated system processes (Yu-Figure 1b, Column 8 Lines 10-15), where the emulated system processes include a listener module for initiating user tasks in response to user commands (Yu-Figure 1a,Column 6 Lines 40-50). Thus in Yu the singular host system 54 is executing both server code and also executing client code.

The Applicant presents the following argument(s) [*in italics*]:

'... there is nothing in the teachings of Fletcher (monitoring communication performance in a communication network) that would motivate one to combine it with the teachings of executing programs that share a common communications protocol stack as disclosed in Yu... There is no teaching or suggestion of such a modification in Fletcher.

The Examiner respectfully disagrees with the Applicant.

In Column 2 Lines 25-30 Fletcher disclosed that it is not possible to quickly pinpoint a problem as either a network problem or a system problem, and cites an example (Fletcher – Column 25 Lines 40-45) wherein, in resolving a response time issue, the network manager is required to determine if there is a problem with the communication line or with router(s) along that line. It would have been obvious to a person of ordinary skill in the art that in order to create an effective monitoring environment all unnecessary factors that may affect the monitored environment should be eliminated, such as external communication line problems mentioned by Fletcher. Thus, Fletcher would have been motivated to look for disclosures regarding environments that permit client and server operations in a single workstation, such as disclosed by Yu. Furthermore Yu provides additional motivation for combination in disclosing that said system enhances overall system performance and eliminates the need for additional resources. (Yu – Column 4 Lines 1-5)

The Applicant presents the following argument(s) [*in italics*]:

'...contrary to the present invention, Fletcher uses separate computer systems for the client and the server and a physical communication network... Yu discloses a local system and a remote system in which a client process is run on the local system and a server process is run on the remote system...'

The Examiner respectfully disagrees with the Applicant. Yu disclosed that there is no requirement that the emulated systems be located in a physically separate computer system. (Yu – Column 4 Lines 15-20) Thus Yu disclosed a single computer system emulating a server and a client.

The Applicant presents the following argument(s) [*in italics*]:

'... the Examiner has taken the position, unsupported by the references of record, that Fletcher can be modified to include such limitations without affecting the performance of the Fletcher system. There is no teaching or suggestion of such a modification in Fletcher.'

The Examiner respectfully disagrees with the Applicant. Fletcher, in describing the computer system(s) being monitored (Fletcher- Column 5 Lines 15-60), does not in any manner present any limitation(s) that would disqualify the computer system presented by Yu. Thus, in the aforementioned combination of Fletcher and Yu, the modifications on Fletcher would have consisted of simply replacing one of Fletcher's computer systems and discarding the other(s).

Furthermore, the MPEP states that ' The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference.... Rather, the test is what the combined teachings of those references would have suggested to those of ordinary skill in the art.' As presented above, Fletcher provides clear motivation for studying and combining the teachings of Yu.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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